



**(Clean Copy version) PLANT PATENT**

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**APPLICATION FOR UNITED STATES PLANT PATENT**

**for**

**CHRYSANTHEMUM PLANT NAMED 'NIRVANA IMPROVED'**

**by**

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This application claims the benefit of U.S. Provisional Application No. 60/396,824, filed July 17, 2002.

#### LATIN NAME OF THE GENUS AND SPECIES

Botanical classification: *Chrysanthemum morifolium*.

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#### VARIETY DENOMINATION

The new Chrysanthemum variety denomination is 'Nirvana Improved.'

#### BACKGROUND OF THE INVENTION

The present invention comprises a new and distinct cultivar of Chrysanthemum botanically known as *Chrysanthemum morifolium*, and referred to by the cultivar name 'Nirvana Improved'.

'Nirvana Improved', identified as 20668-1, originated from a cross made in a controlled breeding program in Cleangro Limited, Vinnetrov Road, Chichester, West Sussex, United Kingdom. The female parent of the new variety is an undistributed, unpatented seedling identified as 'P452C7'. The male parent of the new variety is an undistributed, unpatented seedling identified as '20038-0'. The new variety 'Nirvana Improved' has been asexually reproduced by vegetative cuttings in Chichester, West Sussex, United Kingdom, and the distinguishing characteristics are retained through successive generations of asexual reproduction.

#### BRIEF SUMMARY OF THE INVENTION

'Nirvana Improved' is a pot type of Chrysanthemum plant variety having yellow and red single flowers with a light green disc.

#### Comparison with Female Parent

Plants of the new Chrysanthemum variety 'Nirvana Improved' are dissimilar to the female parent 'P452C7' in plant habitat and growth rate. In side-by-side comparisons in Chichester, West Sussex, United Kingdom, under commercial

practice, plants of the new Chrysanthemum variety 'Nirvana Improved' differed from plants of the parent 'P452C7' in the following characteristics.

1. The new variety 'Nirvana Improved' produces yellow and red single flowers whereas the parent 'P452C7' produces white and purple flowers.
- 5 2. Plants of the new variety 'Nirvana Improved' have larger and taller inflorescence than plants of the parent 'P452C7'.

#### Comparison with Male Parent

Plants of the new Chrysanthemum variety 'Nirvana Improved' are dissimilar to the male parent '20038-0' in plant habitat and growth rate. In side-by-side  
10 comparisons in Chichester, West Sussex, United Kingdom, under commercial practice, plants of the new Chrysanthemum variety 'Nirvana Improved' differed from plants of the parent '20038-0' in the following characteristics.

1. The new variety 'Nirvana Improved' produces yellow and red single flowers whereas the parent '20038-0' produces red single flowers.
- 15 2. Plants of the new variety 'Nirvana Improved' have larger and taller inflorescence than plants of the parent '20038-0'.

#### Comparison with Other Varieties

Plants of the new Chrysanthemum variety 'Nirvana Improved' are similar to 'Machismo Time' (U.S. Plant Patent Application Publication No. US 2003/0056261)  
20 in plant habitat and growth rate. However, in side-by-side comparisons in Chichester, West Sussex, United Kingdom, under commercial practice, plants of the new Chrysanthemum variety 'Nirvana Improved' compared to plants of 'Machismo Time' in the following characteristics.

- 25 1. The new variety 'Nirvana Improved' produces yellow and red single flowers whereas 'Machismo Time' produces yellow and red single flowers.
2. Plants of the new variety 'Nirvana Improved' have larger and taller inflorescence than plants of 'Machismo Time'.

3. The flowers of the new variety 'Nirvana Improved' have more yellow contrast than 'Machismo Time'.

#### BRIEF DESCRIPTION OF ILLUSTRATIONS

Typical specimens of the plant and flowers for the new Chrysanthemum variety 'Nirvana Improved' are shown in the accompanying digital photograph. The colors shown are as true as possible within the usual limits of this kind of illustration. Figure 1 is a whole plant view of the new variety 'Nirvana Improved' grown in a pot. The plant shown in the illustration and described here is 52 days from the commencement of Short Days.

#### 10 DETAILED BOTANICAL DESCRIPTION

The following description of the new Chrysanthemum variety 'Nirvana Improved' is of plants grown in a greenhouse in Chichester, West Sussex, United Kingdom, in the month of February. The cultivar has not been observed under all possible environmental conditions. The phenotype may vary significantly with variations in the environment such as temperature, length of day and light intensity, without any variance in genotype. The commercial classification of the new variety is a pot Chrysanthemum.

Plants of the new variety have been grown successfully under temperature conditions averaging about 18°C at night and about 24°C to 25°C during the day under light conditions of about 5000 to 6000 foot candles. The plants respond well to the use of growth retardant, such as B9 treatment. To produce a commercial product the plants may be pinched once with the center bud removed. The typical container size for commercial growth is 14 cm. It has been observed that the shelf life of the new variety is about 24 days with a response time of about 7.5 weeks. The new variety is suitable for growth in a temperature range of 17°C to 28°C.

The following description is with respect to a plant produced as pot Chrysanthemum. In the description of this new Chrysanthemum variety, color values have been taken from the Royal Horticultural Society Colour Chart (R.H.S.C.C.).

Plant

Plant type: Pot

Habit: Upright and free branching

Height: 21 cm

Width: 36 cm

5 Branching characteristics: Upright and free branching

Length of Lateral Branches: 5-16 cm

Diameter of Lateral Branches: 0.7 cm

Texttture of Lateral Branches: Slightly pubescent

Number of Breaks from Pinch: 3-5

10 Stem Length: 5.5 cm

Stem Diameter: 0.6 cm

Stem Color: 137C

Stem Texture: Slightly pubescent

Response Time: 52

15 Vigor: Medium / Tall

Shelf Life: 24 days

Disease/Pest (Susceptibility/Resistance observed): None observed to date

Growth retardant type and treatment: 3 applications of 2.5 gm/liter B9 @ 2, 21 and 28 days after sticking of unrooted cuttings.

20 The plants were grown for 3 weeks in Long Day conditions (20 hours of light) and then transferred to Short Day conditions (13 hours of dark).

Propagation:

*Type:* Vegetative Propagation Via Stem Cuttings

*Time to rooting:* 12-14 days with soil temperatures of 18°C

25 *Rooting habit:* Fine and Fibrous

#### Foliage

Number of Leaves Per Lateral Branch: 8-11

Compound or single: Single

Arrangement of Leaves: Alternate

- Shape of Leaf: typically 5 lobed ovate  
Size of Leaf:           *Width* (cm): 5-8.5 cm           *Length* (cm): 3-10 cm  
Leaf Apex: Acute  
Base: Cordate  
5     Attachment: Petioled  
Aspect: Slightly undulating  
Margin: Palmetely lobed  
Surface characteristics:     *Top*: Slightly pubescent  
                                      *Bottom*: Pubescent  
10    Petiole:       *Color*: 139C  
                      *Length*: 0.5-2.5 cm  
                      *Diameter*: 0.2 cm  
                      *Texture*: Slightly pubescent  
Venation: Net prominent midvein at underside  
15                *Color: upper side*: Near 138B  
                      *under side*: Near 138B  
Color:       Mature Leaf, *upper side*: Near 137A; *under side*: Near 137B  
              Young Leaf, *upper side*: Near 137B; *under side*: Near 138A  
                                      Flower  
20    Flower appearance: Matte  
Flower type: Single  
Flower form: Flat  
Flower shape: Circular  
Flower habit: Flat Capitulum  
25    Number of blossoms per branch: 3-5  
Typical flowering season: January - December  
Inflorescence form: Cyme  
          Depth of fully expanded blossoms: 1.5 cm  
          Diameter of fully expanded blossoms: 9 cm  
30    Phyllaries:

*Number:* 25-30

*Outer Color:* Near 137C

*Length:* 0.5-0.9 cm

*Width:* 0.2-0.5 cm

5      *Texture/Appearance:* Pubescent

Peduncle: peduncle length is shortest at the terminal flower and progressively longer moving down the stem.

*Length:* 3-12 cm, average 5 cm

*Color:* Near 137D

10      *Diameter:* 0.7 cm

*Surface:* Pubescent

*Habit:* Slightly curving

*Strength:* Moderately strong

Pedicel:

15      *Length:* terminal: 3-6 cm; lateral 5-8 cm

*Diameter:* 0.3 cm

*Color:* Near 139C

*Surface:* Pubescent

*Habit:* Slightly curving

20      *Strength:* Moderately strong

Ray florets:

*Form/Shape:* Straight with parallel edges to the central mid-vein and a rounded tip

*Texture/Appearance:* Matte

25      *Number per flower:* 30

*Length:* 2.5 cm; *Width:* 0.8 cm

*Apex:* Rounded

*Base:* Tapered

*Margin:* Entire

30      Disc florets:

*Form/Shape:* Cylindrical

*Texture/Appearance:* Shiny

*Number per flower:* 150-200

*Length:* 0.6 cm; *Width:* 0.1 cm

5      *Diameter of disc:* 1.5 cm

Fragrance: None

Flower Bud (at onset of color):

*Length:* 0.5 cm

*Diameter:* 1 cm

10      *Form/shape:* Globular

General flower color:

1.      Ray florets, *upper side*:

*Immature:* Near 44B from base to center and 16B from center  
to apex

15      *Mature:* Near 44B from base to center and 16C from center to  
apex

*Older/Fading:* Near 44C from base to center and 16C from  
center to apex

2.      Ray florets, *under side*:

20      *Immature:* Near 44B from base to center and 16C from center  
to apex

*Mature:* Near 44B from base to center and 16D from center to  
apex

25      *Older/Fading:* Near 44B from base to center and 16D from  
center to apex

3.      Disc florets:



*Immature:* Near 143C

*Mature:* Near 151B

*Older/Fading:* Near 151D

4. Bud: 44C

5 Flower progression with age: Flower form does not change but there is a slight fading of color.

Lastingness of blooms: about 24 days

Reproductive Organs

Gynoecium observed on Ray and Disc florets.

10 Ray florets per individual flower:

*Pistil Number:* >25

*Stigma color:* Near 7A

*Stigma shape:* Forked

*Style Color:* Near 145C

15 *Style Length:* 0.4 cm

Disc florets per individual flower:

*Pistil Number:* >25

*Stigma color:* Near 7A

20 *Stigma shape:* Forked

*Style Color:* Near 145C

*Style Length:* 0.4 cm

Androecium not observed.

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Fruit and Seeds: None observed to date